



**DU – 033**

**VII Semester B.E. (Civil) Degree Examination, December 2017/January 2018  
(Semester Scheme) (2K11)  
CE-704 : TRANSPORTATION ENGG. – III**

Time : 3 Hours

Max. Marks : 100

**Instructions :** 1) Answer **any 3** questions from Part – **A** and **one** question each from Part – **B** and **C**.  
2) Assume any missing data **suitably**.

**PART – A  
(Railway Engineering)**

1. a) Draw cross section of a B.G. Double line track with electrification and indicate all the component parts with dimensions and explain the functions of each. **10**  
b) Explain with sketches, the various types of rail failures. **10**
2. a) List the different materials that could be used as ballast, mentioning advantages of each ballast material. **10**  
b) Define the terms : equilibrium cant, negative cant, cant deficiency and grade compensation. **10**
3. a) Discuss the necessity and effects of coning of wheels and tilting of rails with sketches. **10**  
b) A locomotive has four pairs of driving wheels, the load on each wheel being 12.50 tonnes. What is the total weight of the train that can be hauled at an uniform speed of 95 Kmph, while moving on a straight B.G. track ? What is the reduction in speed, if the same train moves on an ascending gradient of 1 in 140 ? **10**
4. a) Draw a neat diagram of a simple right hand turn out and indicate various parts. Explain the working principle of the turn out. **10**  
b) Design a turn out with 1 in 12 crossing for a BG track, if the heel divergence is 12.30 cm, straight arm crossing 1.35 m and the switch angle is  $1^{\circ}6''$ . **10**
5. a) What is permanent way ? Discuss the ideal requirements and functions of a P.W. **10**  
b) Write short notes on the following : **10**
  - i) Acute angle crossing and
  - ii) Diamond crossing.

**P.T.O.**



**PART – B**  
**(Tunnel Engineering)**

6. a) Explain the needle beam method of tunnelling in soft soils. **10**  
b) Explain the method of transferring of centre line from the surface to underground, inside the tunnel. **10**
7. a) Explain briefly classification of tunnels. **10**  
b) What are the functions of tunnel ventilation system and explain the mechanical method of tunnel ventilation with suitable sketches. **10**

**PART – C**  
**(Harbour Engineering)**

8. a) Explain briefly, the various factors to be considered while selecting a site for the construction of a harbour. **10**  
b) Explain briefly, with sketches natural harbour, semi natural harbour and artificial harbour with suitable examples. **10**
9. a) Explain by suitable sketches the different types of breakwaters that are commonly adopted in a harbour. **10**  
b) Given a fetch of 42 N-Km and a wind speed of 17 Kmph, calculate significant and maximum wave :  
i) height  
ii) period  
iii) velocity. **6**
- c) Explain briefly, wet dock. **4**
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